Bridging the gap: Addressing immigrant health through community-initiated screening events

Sally Moyce, RN PhD[1], Nathaniel Sisson, BS[2], Madeline Metcalf, BS[1]

[1] Montana State University, Bozeman, MT

[2] University of Washington Medical School, Seattle, WA

Sally Moyce ORCID: 0000-0003-0995-6239

ABSTRACT

Background: In areas of new-immigrant population growth, medical and social infrastructure may be lagging behind the needs of those who do not identify with the majority culture or language. Subsequently, information regarding this population's health status and access to care is limited. Montana's Hispanic population is one such group. Despite its low total population, the state has experienced unprecedented growth in the number of Spanish-speaking individuals and families over the last decade.

Objectives: We utilized a community based participatory research (CBPR) framework to emphasize equal partnership between lay community members and researchers to ensure adherence to community priorities and strengthen trust between the two parties allowing for future collaboration. Based on community request, we designed four health screening events to provide needed health prevention services to the Hispanic community.

Methods: Through collaboration with a community advisory board, we created four health screening events to provide basic primary care services, including height and weight, blood pressure, diabetes, and mental health screenings. We partnered with a team of dental hygienists to provide oral preventive health. We conducted a cost effectiveness analysis, comparing our approach to traditional health services. Study variables were analyzed using ANOVA to examine differences in health outcomes between health screening events.

Results: We screened 140 persons and found that 85.7% lacked health insurance and 80.7% lacked a usual source of care. We also found overweight and obesity in 47.1% and 27.1%, respectively, and hypertension in 63.6%. Services provided by the health screening events were up to $239 less expensive than comparable services provided at local health centers.

Conclusions: Working directly with the community, we designed and implemented health prevention events which served to meet a growing need and to identify and address health concerns among the Hispanic immigrant community.

KEYWORDS: Community health partnerships, Community-Based Participatory Research, Health disparities, Health promotion, Health Services, Immigrants, Health screening

INTRODUCTION

Those who migrate to new immigrant destinations, communities with little previous experience of international immigrants,[1] may be part of a marginalized and hidden population.[2] As such, immigrants may be classified as a hard-to-reach population because of their unfamiliarity with the host culture, language barriers, and a desire to remain under the radar.[3–5] This makes it challenging for health researchers and public health providers to access disease rates in destinations where immigrants are hard-to-reach or are unable to access regular medical care due to a lack of insurance coverage.[6]

One approach to reaching hard-to-reach populations involves community based participatory research (CBPR), a collaboration among community members and researchers to identify research agendas that are truly responding to community needs.[7] CBPR approaches are ideal for collecting data in communities for whom data are missing or limited.[8] Often planned as part of a community-academic partnership, health screening events offer a way to collect prevalence data of disease risks while addressing limited health care options for a community. [9] Most importantly, for participants, health screening events offer a means to enter the health system,[10] learn their own disease risk factors,[11] and receive health education.[12]

Montana, like other states in the rural Mountain West, is a new immigrant destination, and in Gallatin County, Hispanics make up less than 5% of the population.[13] Very little is known about their health status or their access to regular health care. Montana is a large, rural state, one of the "whitest" in the nation with among the fewest immigrants.[14] In contrast to urban states with a history of immigrant arrivals from Latin America, Montana's immigrant population has seen most of its growth in the last decade with increased immigration from Mexico, Venezuela,

Colombia, and Honduras. As a new immigrant destination, health care disparities persist because of an undeveloped infrastructure poised to meet the needs of persons who do not speak English[15] or who do not identify with the majority culture.[14] For those immigrants who lack legal authorization to live and/or work in the U.S., accessing health care services is an added challenge. Undocumented immigrants use significantly less health care than U.S.-born Hispanics.[16] Underutilization of the health care system makes it difficult to estimate the burden of chronic disease in the population, which in turn makes it challenging to plan interventions.

Since 2020, our research team has used the principles of CBPR to engage a community advisory board to identify their perceived health needs and to plan interventions to address those needs through *Proyecto SALUD* (Project Health).[17] The board asked us to implement a number of health screening events to help them identify health risks and to learn more about health services offered in the region. Jointly planning a health screening event not only ensures adherence to community priorities but it opens the possibilities for future collaborations to improve health.[9]

The aim of this study was to assess the chronic disease risk of the Hispanic population and to describe the community-driven process of using health screening events to assess the health of the Hispanic population in a rural state where little is known about their health.

METHODS

Community Advisory Board

As described elsewhere,[17] our research team conducted a community screening event for the Spanish-speaking immigrant community to recruit members of a Community Advisory

Board (CAB). During the first health screening event, held at a local church, we asked persons interested in working with our team to provide their contact information. Fifteen interested individuals signed up. We invited those individuals to participate in a focus group with our team to learn more about the community and its concerns. Following the focus group, we asked participants if they wanted to continue to work with us, and five persons agreed to meet regularly.

The CAB consisted of persons representing many of the countries of origins of most immigrants in the county: Mexico, Venezuela, and Colombia. Three CAB members were men, two were women, and they were all in their late 30s to late 40s. Two members were engineers, one was a construction company owner, one owned a cleaning business, and one was the president of a non-profit serving immigrants.

We conducted biweekly meetings with the team at the local church. We served lunch and compensated the CAB $25 for each meeting they attended. We solicited input from the members of the CAB about their desired involvement and responsibility in their role, and we continuously reiterated our belief that the members of the CAB were the experts, not the research team. Our first meeting centered around identifying group goals and norms. The CAB suggested ground rules for our meetings, and we agreed upon those rules through a consensus vote. After agreeing on a set of shared norms and responsibilities for our meetings, we conducted subsequent meetings using a Plan-Do-Check-Act (PDCA) cycle, a systematic approach used to implement and evaluate an intervention,[18] to identify the most pressing needs of the community.

While one of the researchers who is an expert in the PDCA cycle led the CAB and the research team through the steps of the cycle, the CAB provided all of the information that

contributed to determining the health needs of the community. We learned that a lack of health insurance prevented many persons from accessing care. We also learned that most immigrants worked six days a week and were not able to attend medical appointments during regular office hours. The CAB told us that the first health screening event was well-received, and they asked us to provide more events. We then used meetings to determine what services they wanted to see offered, locations, and promotional strategies. The CAB also surveyed their community contacts about the types of services they would like to see offered at the health screening events.

Health Screening Events

Participants and Setting

Planning meetings with the CAB resulted in an additional four health screening events (after the recruitment event) for the Hispanic community in Gallatin County, Montana. We advertised health fairs via the CAB, flyers posted at various locations where Hispanics frequent, through local churches and community organizations, and through a private Facebook group. Participation was open to the public, but all promotional materials were in Spanish. We chose locations of the events based on popular gathering places of the community, as identified by the CAB: at community centers and at the county fairgrounds. To accommodate working schedules, all events were hosted on Sundays and lasted five hours. We invited community organizations identified by the CAB to provide outreach materials to participants at various tables. These included the food bank, the federally qualified health center, an interpretive services organization, a domestic violence center, and a legal organization.

All procedures and protocols were approved by the Institutional Review Board at Montana State University.

Data Collection

Participants checked in at a welcome station where they were given information about the event and signed a consent form in Spanish. Bilingual research assistants gave participants a results card with a unique participant ID number used to collect data anonymously. After a brief explanation of the screening options and community organizations in attendance, participants proceeded to a medical screening area. Participants were directed by members of the CAB who designed the flow of the clinic.

Nursing and medicine students, assisted by Spanish interpreters, collected study measures. Screening measures were chosen based on U.S. Preventive Services Task Force recommendations, clinical skills of students, and feasibility of collecting data in a public space. Participants removed their shoes and outer layers. Students measured height using stadiometers and measured weight; we calculated body mass index (BMI), classified according to the World Health Organization:[19] underweight (<18.5), healthy weight (18.5-24.9), overweight (25.0-29.9), obese (≥30.0). Students drew a capillary blood sample which was analyzed using a DCA Vantage Analyzer (Siemens, PA), and we classified diabetes status according to the recommendations of the American Diabetes Association:[20] normal (<5.7%), pre-diabetes (5.7-<6.5%), diabetes (≥6.5%). Students took a seated blood pressure using an automatic blood pressure cuff (Omron Electronics, IL) and classified readings according to the American Heart Association:[21] normal (<120/80mm Hg), elevated (120-129/<80mm Hg), hypertension (≥130/80mm Hg). Study personnel calibrated all instruments prior to health screening events per manufacturer protocols. To mitigate potential low literacy levels, research assistants orally administered a in Spanish to assess socioeconomic risk factors, health behaviors, oral health

history, and mental health. We classified depression based on the Patient Health Questionnaire 2-item scale (PHQ-2)[22] and anxiety based on the Generalized Anxiety Disorder 7-item scale (GAD-7).[23] Both scales have been tested for use in Spanish and found to have high internal consistency (PHQ Cronbach's alpha >0.8[24]; GAD Cronbach's alpha>0.9.[25])

Health Screening Event Procedures

After participants were screened, we entered results into a study database and recorded them on results cards. Nursing or medicine students, assisted by interpreters, counseled participants their results. A bilingual senior nursing student or nursing professor oversaw counseling sessions and further referred participants with elevated blood pressure or pre-diabetes to a health department nurse who administers county-wide health promotion programs aimed at reducing risk factors for cardiovascular disease. We referred participants who scored high on the mental health screening tests to a mental health intervention study conducted by our team. Students counseled all participants to seek medical care at the only community health center in the region to address concerns.

Additional Services

The CAB identified the lack of dental care as a concern for the community. Therefore, we invited Smiles Across Montana, a non-profit who provides mobile preventive dental care, to provide services. Participants were eligible to receive preventive oral health care by dental hygienists who provided cleaning, x-rays, exams, and referrals for increased levels of dental care. A nurse case manager on our team managed rReferrals to local dentists , and we provided a small incentive to those participants to help offset costs of further dental care. The county health

department was also on site and provided vaccinations, including COVID, HPV, influenza, pneumonia, and TDaP.

Data Analysis

We used descriptive statistics and compared study variables using one-way analysis of variance (ANOVA) to estimate differences between outcomes at each health screening event. We conducted data analysis using Stata 15 (Stata Corp LLC, College Station, TX).

We also present data on the cost-effectiveness of the screening events compared to two local health care organizations (one a major health system, the other a federally qualified health center) and reimbursement rates from the Centers for Medicare and Medicaid (CMS) for annual wellness visits. (CMS does not cover dental care in most cases, therefore we excluded estimations of CMS services from the analysis of dental costs.) The federally qualified health center provides primary care to patients and bills on a sliding scale for those who lack insurance. We obtained costs per services by directly contacting the billing departments of both organizations. We estimate costs of the health screening events using the model provided by the Program Cost Analysis tool from the Centers for Disease Control and Prevention (https://www.cdc.gov/policy/polaris/economics/program-cost/index.html). We included the cost of research assistants (5 people x $20/hour) and the cost of facility rental divided by the number of participants in the total costs of the health history. Hemoglobin A1c cost is based on the cost of the supplies (reagent cartridge, retractable needles, sharps disposal). Dental costs include those for basic exam, x-rays, and cleaning based on the expenses paid to the dental hygienist team.

In follow-up meetings, we shared results of our findings with the CAB and asked for continued input into future directions for interventions. We also debriefed each event and made modifications to recruitment, location, participant foot traffic, and procedures.

RESULTS

We conducted four health screening events on a total of 140 participants in the following months: June 2021 (n=48), October 2021 (n=44), May 2022 (n=23), and June 2022 (n=24). We screened slightly more men than women (79 versus 60), and the majority were between 18-34 years (n=53) or 35-49 years (n=46). The majority of the participants reported having no insurance (85.7%) or no usual source of care (80.7%). Most were employed (67.1%) and most rated their ability to speak and read English as poor (70.0% and 68.6%, respectively). (Table 1.) When we compared the demographic results using one-way ANOVA, we found a statistically significant difference in the reported usual source of care between May 2022 and the other events. Significantly less participants had a usual source of care at the May event. This is likely due to the location of the event being in a remote, rural area of the county.

There were no statistically significant differences in the health variables we collected. Nearly half of the sample was overweight (47.1%), and nearly a third were obese (27.1%). The majority did not have diabetes (63.6%), though the same percentage had high blood pressure. Most did not have depressive symptoms (79.3%) or anxiety symptoms (69.3%), though 10% had severe anxiety. While 35% had seen a dentist within the last year, most (60.7%) had not visited a dentist in more than two years. (Table 2.)

Financial comparisons of the cost of services are included in Table 3. When we compared the costs of health screening visits among the local health organization, a federally qualified

health clinic, and CMS reimbursement, we found our screenings to be $239, $207, and $93 less expensive, respectively. When we compared preventive dental screenings, our services were $90 less expensive than a local dentist, and $18 less expensive than the federally qualified health center.

During the debriefing meetings with the CAB, members of the CAB told us that the most popular services provided were the immunizations (especially COVID vaccines) and the dental care. Based on their assessment of the community, the CAB noted that participants use the health screening events as their primary health care. The CAB suggested that we continue to offer health screening events at three-month intervals and increase the availability of chronic disease management providers through partnerships with a local health system. We also shared this information through presentations to community organizations who joined the health screening events. These data, as well as the success of our team in engaging the community, will serve to inform other providers about the health concerns of the Hispanic community and help identify other resources the community may need to access.

DISCUSSION

We report on the implementation of community health screening events for an underserved population in the new immigrant community of Montana and describe efforts to estimate chronic disease risk factors in study participants. This event is an example of a successful academic-community partnership designed to gain a general understanding of health status while providing resources and information to the Hispanic community.

These efforts were driven by partnership with the community, and the CAB identified community needs and directed outreach efforts to promote the events. CBPR is an approach to

research that is well-poised to address immigrant health by allowing the community to define and design the intervention they desire.[26] Involving members of the community we hoped to reach gave us their unique insight and assisted us in promotion and recruitment for the events. CBPR increases community engagement and buy-in,[27] which is important in a hard-to-reach population who may not trust the majority culture. CBPR also has implications for public health practice, allowing the community to design a health intervention that meets their needs.[28] We were able to offer our health screening events in locations the community trusted and during times they were not working and could access the services.

Health screening events are cost-effective ways to meet community needs, particularly in communities where access to care is limited due to a variety of reasons.[29] We compared our costs to costs estimated by local healthcare providers and to the reimbursements offered by CMS. Our costs were much lower for preventive screening visits, which did not surprise us due to our use of volunteer nursing and medicine students, a nurse practitioner, and local community organizations. We did not factor in interpretive services to these estimates, which would further demonstrate cost savings. Our estimates of dental care prices were less impressive. However, we paid the full rate for the services of Smiles Across Montana and did not rely on volunteers for this service. While the costs for these services are high and we required grant funding to provide them, the CAB notes the high need for dental care in the community. Therefore, we continue to provide these services.

Findings from our study provide previously unknown estimates of disease risk factors among Hispanics in the region and point to unmet medical needs in our sample. Our estimates indicate a large number of persons with cardiovascular risk factors including obesity, elevated

blood pressure, and diabetes.[30] Our estimates are similar to national trends for Hispanic persons.[31] However, without regular medical care, management and evaluation of chronic disease status is difficult to attain. We found a high prevalence of uninsured and those without a regular source of medical care, which suggests that our participants are at increased risk for developing complications of these health conditions.

We screened for mental health symptoms and found that 16% of the sample reported depressive symptoms and nearly 7% reported moderate to severe anxiety. Mental health needs among Hispanics go largely unmet in the U.S. and Montana,[32] and our findings point to another potential area for intervention and program development. Hispanics are screened for mental health concerns less than non-Hispanic Whites,[33] and stigma within the Hispanic community may contribute to underutilization of mental health services by this population.[34] Therefore, routine screening and referrals to follow up programs are important.

Limitations

A major limitation to our study is the sample size and the fact that we did not collect information on all variables at all health screening events. We follow each event with a debriefing session with our program leads, volunteers, and CAB, and development of new screening tools evolve out of those meetings. We used a convenience sampling technique, and sampling bias may exist as persons who attended the health screening events are likely to lack health insurance and access to care. We recognize that our results cannot be generalized to the wider Hispanic population, though because our findings are similar to national estimates, we are confident in their accuracy. Additionally, as immigration in other Mountain West states grows, our results may inform providers seeking to offer health services to the Hispanic population.

Another limitation is that while we attempted to refer participants to further medical care, we were not able to track the number of persons who sought additional care after the events. Health screenings are useful in identifying persons with elevated risk for disease, but without an adequate safety net system, referring uninsured persons to care is a barrier. Further work by our team is underway to develop referral networks and partnerships to strengthen this. Finally, community-based community research principles suggest involvement of the community at all stages of the research process. We did not include members of the CAB in the development of this manuscript due to language barriers and time constraints of the CAB members. While we notify the CAB of any publications resulting from our work, this manuscript represents solely the views of the research team.

Health screening events are designed to meet the need of populations who lack health resources, particularly those who lack health insurance. Immigrants may be uninsured due to documentation status, employment status, or an unfamiliarity with the workings of the U.S. healthcare system.[35,36] Effective strategies to provide regular care are needed for this community, especially those which are culturally and linguistically relevant.[6] Working with the community itself, we implemented health screening events that often serve as participants' only access to medical care.

ACKNOWLEDGEMENTS

REFERENCES

1. McAreavey R, Argent N. New immigration destinations (NID) unravelling the challenges and opportunities for migrants and for host communities. *J Rural Stud*. 2018;64:148-152.

2. Misra S, Kwon SC, Abraído-Lanza AF, Chebli P, Trinh-Shevrin C, Yi SS. Structural racism and immigrant health in the United States. *Health Educ Behav*. 2021;48(3):332-341.

3. Bonevski B, Randell M, Paul C, et al. Reaching the hard-to-reach: a systematic review of strategies for improving health and medical research with socially disadvantaged groups. *BMC Med Res Methodol*. 2014;14(1):1-29.

4. Kelley A, McCoy T, Fisher A, Witzel M, Fatupaito B, Restad D. Comparability of Survey Measures in Hard to Reach Populations: Methods and Recommendations. *Pract Assess Res Eval*. 2020;25:9.

5. Benoit C, Jansson M, Millar A, Phillips R. Community-academic research on hard-to-reach populations: Benefits and challenges. *Qual Health Res*. 2005;15(2):263-282.

6. Lee J, McKennett M, Rodriguez X, Smith S. Implementation and Evaluation of a Recurring Interdisciplinary Community Health Fair in a Remote US–Mexico Border Community. *J Immigr Minor Health*. 2019;21(1):136-142.

7. Collins SE, Clifasefi SL, Stanton J, et al. Community-based participatory research (CBPR): Towards equitable involvement of community in psychology research. *Am Psychol*. 2018;73(7):884.

8. Nguyen G, Hsu L, Kue KN, Nguyen T, Yuen EJ. Partnering to collect health services and public health data in hard-to-reach communities: a community-based participatory research

approach for collecting community health data. *Prog Community Health Partnersh Res Educ Action*. 2010;4(2):115-119.

9. Hamilton KC, Henderson Mitchell RJ, Workman R, Peoples EA, Higginbotham JC. Using a Community-based Participatory Research Approach to Implement a Health Fair for Children. *J Health Commun*. 2017;22(4):319-326.

10. Parks MH, Chen CK, Haygood CD, McGee ML. At-Risk Stakeholder Behavior Change with Community-Based Health Events. *J Health Care Poor Underserved*. 2019;30(3):1184-1196. doi:10.1353/hpu.2019.0081

11. Murray K, Liang A, Barnack-Tavlaris J, Navarro AM. The reach and rationale for community health fairs. *J Cancer Educ*. 2014;29(1):19-24.

12. Briant KJ, Wang L, Holte S, Ramos A, Marchello N, Thompson B. Understanding the impact of colorectal cancer education: a randomized trial of health fairs. *BMC Public Health*. 2015;15(1):1196. doi:10.1186/s12889-015-2499-2

13. U. S. Census Bureau. U.S. Census Bureau QuickFacts: Montana. Accessed April 16, 2020. https://www.census.gov/quickfacts/MT

14. Abrego LJ, Schmalzbauer L. Illegality, motherhood, and place: Undocumented Latinas making meaning and negotiating daily life. *Womens Stud Int Forum*. 2018;67:10-17. doi:10.1016/j.wsif.2017.12.004

15. Hsueh L, Hirsh AT, Maupomé G, Stewart JC. Patient–provider language concordance and health outcomes: A systematic review, evidence map, and research agenda. *Med Care Res Rev*. 2021;78(1):3-23.

16. Ortega AN, McKenna RM, Kemmick Pintor J, et al. Health Care Access and Physical and Behavioral Health Among Undocumented Latinos in California. *Med Care*. 2018;56(11):919-926. doi:10.1097/MLR.0000000000000985

17. Moyce SC, Sisson N, Thompson S, et al. Engaging Latinos in an Academic-Community Partnership in Montana through a Health Screening Event. *Am J Health Educ*. Published online 2021:1-8.

18. Sobek II DK, Smalley A. *Understanding A3 Thinking: A Critical Component of Toyota's PDCA Management System*. Productivity Press; 2008.

19. World Health Organization. Global database on body mass index. 2012. *Glob Database Body Mass Index*. Published online 2012.

20. American Diabetes Association. Classification and diagnosis of diabetes. *Diabetes Care*. 2017;40(Supplement 1):S11-S24.

21. Carey RM, Whelton PK. Prevention, detection, evaluation, and management of high blood pressure in adults: synopsis of the 2017 American College of Cardiology/American Heart Association Hypertension Guideline. *Ann Intern Med*. 2018;168(5):351-358.

22. Bridges AJ, Dueweke AR, Anastasia EA, Hernandez Rodriguez J. The positive predictive value of the PHQ-2 as a screener for depression in Spanish-Speaking Latinx, English-

speaking Latinx, and non-Latinx White primary care patients. *J Latinx Psychol*. 2019;7(3):184.

23. Löwe B, Decker O, Müller S, et al. Validation and standardization of the Generalized Anxiety Disorder Screener (GAD-7) in the general population. *Med Care*. Published online 2008:266-274.

24. Arrieta J, Aguerrebere M, Raviola G, et al. Validity and utility of the Patient Health Questionnaire (PHQ)-2 and PHQ-9 for screening and diagnosis of depression in rural Chiapas, Mexico: A cross-sectional study. *J Clin Psychol*. 2017;73(9):1076-1090.

25. Mills SD, Fox RS, Malcarne VL, Roesch SC, Champagne BR, Sadler GR. The psychometric properties of the generalized anxiety disorder-7 scale in Hispanic Americans with English or Spanish language preference. *Cultur Divers Ethnic Minor Psychol*. 2014;20(3):463.

26. Vaughn LM, Jacquez F, Lindquist-Grantz R, Parsons A, Melink K. Immigrants as Research Partners: A Review of Immigrants in Community-Based Participatory Research (CBPR). *J Immigr Minor Health*. 2017;19(6):1457-1468. doi:10.1007/s10903-016-0474-3

27. Wilkinson-Lee AM, Armenta AM, Leybas Nuño V, Moore-Monroy M, Hopkins A, Garcia FAR. Engaging promotora-led community-based participatory research: An introduction to a crossover design focusing on reproductive and mental health needs of a Latina community. *J Lat Psychol*. 2018;6(4):291-303. doi:10.1037/lat0000119

28. Akintobi TH, Lockamy E, Goodin L, et al. Processes and Outcomes of a Community-Based
Participatory Research-Driven Health Needs Assessment: A Tool for Moving Health
Disparity Reporting to Evidence-Based Action. *Prog Community Health Partnersh Res
Educ Action*. 2018;12(1 Suppl):139-147. doi:10.1353/cpr.2018.0029

29. Dulin MK, Olive KE, Florence JA, Sliger C. The financial value of services provided by a
rural community health fair. *J Health Care Poor Underserved*. 2006;17(4):821-829.

30. Yusuf S, Joseph P, Rangarajan S, et al. Modifiable risk factors, cardiovascular disease, and
mortality in 155 722 individuals from 21 high-income, middle-income, and low-income
countries (PURE): a prospective cohort study. *The Lancet*. 2020;395(10226):795-808.

31. Centers for Disease Control and Prevention. Summary Health Statistics: National Health
Interview Survey: 2018. Published November 6, 2019. Accessed April 22, 2020.
https://www.cdc.gov/nchs/nhis/shs/tables.htm

32. Barrera I, Sharma V, Aratani Y. The prevalence of mental illness and substance abuse
among rural Latino adults with multiple adverse childhood experiences in California. *J
Immigr Minor Health*. 2019;21(5):971-976.

33. Brenes F. Hispanics, mental health, and suicide: Brief report. *Hisp Health Care Int*.
2019;17(3):133-136.

34. Eghaneyan BH, Link to external site this link will open in a new window, Murphy ER.
Measuring mental illness stigma among Hispanics: A systematic review. *Stigma Health*.
2020;5(3):351-363. doi:http://dx.doi.org.proxybz.lib.montana.edu/10.1037/sah0000207

35. Luque JS, Soulen G, Davila CB, Cartmell K. Access to health care for uninsured Latina immigrants in South Carolina. *BMC Health Serv Res*. 2018;18(1):310. doi:10.1186/s12913-018-3138-2

36. Vargas Bustamante A, Chen J, Fang H, Rizzo JA, Ortega AN. Identifying health insurance predictors and the main reported reasons for being uninsured among US immigrants by legal authorization status. *Int J Health Plann Manage*. 2014;29(1):e83-e96.

Table 1. Study Sample Demographics (n=140)

	June 2021 n=49		October 2021 n=44		May 2022 n=23		June 2022 n=24		p-value[a]	Total n=140	
	n	%	n	%	n	%	n	%		n	%
Sex									0.81		
Male	30	61.2	22	50.0	13	56.5	14	58.3		79	56.4
Female	19	38.8	21	47.7	10	43.5	10	41.7		60	42.9
Missing[b]	0	0.0	1	2.3	0	0.0	0	0.0		1	0.7
Age Group									0.07		
18-34 years	10	20.4	24	54.5	11	55.0	8	44.4		53	37.9
35-49 years	24	49.0	10	22.7	6	30.0	6	33.3		46	32.9
50-64 years	12	24.5	5	11.4	3	15.0	4	22.2		24	17.1
65+ years	2	4.1	4	9.1	0	0.0	0	0.0		6	4.3
Missing[b]	1	2.0	1	2.3	3	13.0	6	25.0		11	7.9
Country of Origin									0.08		
Mexico	--	--	22	50.0	5	21.7	22	91.7		49	35.0
Central America	--	--	12	27.3	14	26.9	0	0.0		26	18.6
South America	--	--	9	20.4	2	8.4	1	4.2		12	8.6
United States	--	--	1	2.3	2	8.7	1	4.2		4	2.9
Missing[b]	--	--	0	0.0	0	0.0	0	0.0		49	35.0
Insurance Status									0.88		
Uninsured	42	85.7	40	90.9	19.00	90.5	21.0	87.5		120	85.7
Insured	7	14.3	4	9.1	2	9.5	3	12.5		16	11.4
Missing[b]	0	0.0	0	0.0	2	8.7	0	0.0		4	2.9
Usual Source of Care									<0.01		
Has Usual Source of Care	8	16.3	7	15.9	2	9.5	6	25		23	16.4
No Usual Source of Care	41	83.7	37	80.1	17	81	6	75		113	80.7
Missing[b]	0	0.0	0	0.0	2	8.7	0	0.0		4	2.9
Employment Status									0.32		
Employed	31	63.3	29	65.9	15.00	75	19	79.2		94	67.1
Unemployed	11	22.4	8	18.2	5	25.0	5	20.8		41	29.3
Missing[b]	0	0.0	4	9.1	3	13.0	0	0.0		3	2.1
English Speaking Ability									0.72		
Very well	7	14.3	5	11.4	0.00	0	1	4.2		13	9.3
Fair	7	14.3	8	18.2	5	23.8	7	29.2		27	19.3
Poor	35	71.4	31	70.4	16	76.2	16	66.7		98	70.0
Missing[b]	0	0.0	0	0.0	2	8.7	0	0.0		2	1.4
English Reading Ability									0.44		
Very well	5	10.2	6	13.6	0.00	0	1	4.2		12	8.6
Fair	9	18.4	8	18.2	4	19.0	9	37.5		30	21.4
Poor	35	71.4	30	68.2	17	81.0	14	58.3		96	68.6
Missing[b]	0	0.0	0	0.0	2	8.7	0	0.0		2	1.4

[a] p-value calculated from oneway ANOVA with post hoc Bonferroni correction comparing date of participation

[b] Missing data a result of not asking the question during the event or participant not providing an answer

Table 2. Health Screening Variables (n=140)

	June 2021 n=49		October 2021 n=44		May 2022 n=23		June 2022 n=24		p-value [a]	Total n=140	
	n	%	n	%	n	%	n	%		n	%
Body Mass Index									0.18		
Normal Weight (BMI<25)	8	16.3	11	25.0	6	26.1	4	16.7		29	20.7
Overweight (BMI 25-<30)	22	44.9	22	50.0	12	52.2	10	41.7		66	47.1
Obese (BMI ?30)	19	38.8	10	22.7	4	17.4	6	25.0		38	27.1
Missing [b]	0	0.0	1	2.3	2	8.7	4	16.7		7	5.0
Diabetes Status									0.10		
No Diabetes (a1c<5.7%)	26	53.1	36	81.8	15	65.2	12	50.0		89	63.6
Pre-Diabetes (a1c 5.7-<6.5%)	17	34.7	3	6.8	4	17.4	7	29.2		31	22.1
Diabetes (a1c ?6.5%)	6	12.2	5	11.4	4	17.4	5	20.8		31	22.1
Missing [b]	0	0.0	0	0.0	0	0.0	0	0.0		0	0.0
Blood Pressure									0.21		
Normal (<120/80)	9	18.4	10	22.7	8	34.8	2	8.3		29	20.7
Elevated (120-129/<80)	17	34.7	22	50.0	2	8.7	3	12.5		16	11.4
Hypertension (?130/80)	23	46.9	12	27.3	11	47.8	16	66.7		89	63.6
Missing [b]	0	0.0	0	0.0	2	8.7	3	12.5		6	4.3
Depression Screening							24		0.09		
No Depressive Symptoms	37	75.5	36	81.8	18	78.3	20	83.3		111	79.3
Depressive Symptoms	11	22.5	4	9.1	1	4.3	1	4.2		17	12.1
Missing [b]	1	2.0	4	9.1	4	17.4	3	12.5		12	8.6
Anxiety Screening									0.68		
No Anxiety	37	75.5	30	68.2	15	65.2	15	62.5		97	69.3
Mild Anxiety	4	8.2	8	18.2	3	13.0	1	4.2		18	12.9
Moderate Anxiety	4	8.2	0	0.0	0	0.0	2	8.3		7	5.0
Severe Anxiety	0	0.0	2	4.5	3	13.0	4	16.7		14	10.0
Missing [b]	4	8.2	4	9.1	2	8.7	2	8.3		4	2.9
Oral Health History									0.17		
Seen a dentist in the last 6 months	0	0.0	12	27.3	4	17.4	7	29.2		30	21.4
Seen a dentist in the last year	9	18.4	6	13.6	4	17.4	3	12.5		19	13.6
Seen a dentist in the last 2 years	14	28.6	9	20.4	6	26.1	2	8.3		23	16.4
Seen a dentist in the last 5 years	10	20.4	4	9.1	4	17.4	3	12.5		30	21.4
Hasn't seen a dentist in over 5 years	3	6.1	3	6.8	3	13.0	6	25.0		23	16.4
Never seen a dentist	9	18.4	10	22.7	0	0.0	3	12.5		9	6.4
Missing [b]	4	8.2	0	0.0	2	8.7	0	0.0		6	4.3

[a] p-value calculated from ANOVA or chi-square tests comparing date of participation

[b] Missing data a result of not asking the question during the event

Table 3. Cost Analysis of Health Screening Services

Service	Major Health System	Federally Qualified Health Center	Centers for Medicare/ Medicaid Services[1]	Health Screening Event	
Health History with Vitals	$229.00	$197.00	$117.00	$25.00 [2]	
Hemoglobin A1c (diabetes)	$47.00	$47.00	$13.42	$12.00	
Health Screening Totals	**$276.00**	**$244.00**	**$130.42**	**$37.00**	
Dental (exam, x-rays, and cleaning)	**$232.00**	**$160.00**	**N/A**	**$142.00**	
Totals	**$508.00**	**$404.00**	**N/A**	**$179.00**	
[1] Based on reimbursement for annual wellness vists. CMS does not cover dental care.					
[1] Dental costs provided by local dentist office, not affiliated with major health system					
[2] Cost includes per participant cost of building rental and research					